

## **“Regulus to Trident II: The Story of U.S. Naval Nuclear Superiority”**

**Vice Admiral Michael J. Connor**

**AFGSC Global Strike Challenge**

**5 November 2014**

Thank you.

First of all thank you for the welcome. It started yesterday. I showed up here in a C-12, landed out I guess in front of the main terminal here, and it was awesome, as we say in Boston. There was a big red carpet laid out there, there were people waiting. There was one of those black SUVs that you see. I was really impressed. I don't normally get that type of treatment.

General Wilson came out and welcomed me, and it was amazing. He said hi Mike. I said hi Seve. And he pointed back to the runway and he said, you see that plane that's landing? I said I do. That's the Secretary of the Air Force. You need to get the heck out of the way.

So I got my [adjustment] here.

I do have one question. Should I be worried about these people with the sticks?

I probably do look a little bit different than other people at this conference, but the theme I want to talk to today is that in many ways we're in the same business with the same challenges. That's the theme I have.

I know these slides are somewhat difficult to see, but you probably recognize that B-29 there, the Enola Gay in the middle at least. On the right side what you see is that famous aviator, Paul Tibbitts who was in fact the pilot in command the first time a nuclear weapon was used in anger. He led that mission and he led quite a few things after that. Set a great tradition. Some of you might even know his grandson, an Air Force general officer who works at [SkyCom] carried on that tradition.

But on the left, in the upper left, is a picture of a Navy captain and his name is Deke Parsons. He was sort of the classic naval officer of the day. He grew up in destroyers and battle ships and he was a bit of a -- First of all what was the fashion if you were in those ships was to be an expert on [government]. He was. But he was also probably an out of the boxes thinker, and he [inaudible] radar at a time when in the Navy they looked down on that invention. They thought it was unseamanlike or something. He sort of established a reputation as being an out of the box thinking in that regard.

Then in World War II he took his gunnery expertise and his radar expertise and he was one of the inventors of this thing called a proximity fuse. Anybody know what that is? That's the thing that basically takes a dumb anti-aircraft munition that [hasn't] actually hit the aircraft it was going to hit, and basically it created this tiny little radar system that could sustain something like 10,000 Gs of force when it was launched and thousands of rotations per second, and make it small enough to fit at the pointy end of an artillery shell and it magically makes these shells able to shoot down a whole

bunch more aircraft than they otherwise could because their effective range was hundreds of times larger.

Then the Navy did something that was typical of our bureaucratic way, he said well, this thing is pretty cool, it's pretty secret, we don't want to share it with anybody especially somebody who might use it over land where it could fall, a failed shell could be captured and the enemy could exploit it.

So there was actually a period of time when the Navy was using these things over water in the Pacific and this battle, this hugely important battle was taking place over land in Europe and we weren't bringing that capability to bear. He was one of the people influential in changing that too, so that we got more of this team, spirit, shared what we know so that everybody wins, don't worry about your little segment so much.

Anyway, he was recognized for that and then he was put on the Manhattan Project. His piece of the Manhattan Project, there were two basic types of weapons. There was the Little Boy and [Pacman] or something like that. So he was the Little Boy guy which is the gun-type munition, because that's what he was good at, and that's what was used in the first mission over Hiroshima.

So the point is, this whole business of strategic warfare, strategic deterrence has been an Army/Air Force/Navy or Air Force/Navy endeavor right from the day it started. That tradition continues.

Then we went on to figure out how we could do this mission at greater range. So the newly formed Air Force and the Navy each did sort of the same thing. We both stole German technology in some cases German scientists, and helped them adapt the things that they were using in World War II to this new strategic mission. There was a fair amount of innovation involved in that, and how to do launches and so the Navy side of that, we rapidly advanced to the point where we wanted to launch a [inaudible] cruise missile [inaudible], launching a cruise missile from a submarine. Now we couldn't do it submerged, so we started off with a sort of interim solution where we carried them submerged, we'd get where we needed to be, we would surface, and then we would shoot them. And it worked, kind of, but the ranges were pretty short, about 500 miles. And a lot of the things that we would have needed to hit were further, but it was a stop-gap measure that allowed the country at a very dynamic time to have something that could have this overwhelming force that could be used to deter bad things from a great capable country, in this case Russia, that new were very concerned about.

That evolved during the '50s as something more sophisticated. So again, this is now the Air Force solution [and] the Navy solution. On the Air Force side of course General Curtis LeMay was that, and I'm not going to lecture you on him, but he was that magnificent force behind so many things in the young Air Force including the strategic mission that we all served in. He had his technical guy, General Schriever, who made a lot of things happen. And I'm not going to lecture you on that.

But I'm going to tell you a little bit about the Navy side. Our CNO then was a guy named Arleigh Burke, and he saw the need for the Navy to take up its portion of that mission, and he found this guy named Admiral Rayborn who had the technical savvy to do it.

He probably would have picked Deke Parsons, but unfortunately he passed away at a young age, so he found Admiral Rayborn who had made his name in World War II with a fairly dramatic engineering feat. He was executive officer on an aircraft carrier that launched their entire air wing into battle. And after all the airplanes took off, his carrier was struck by a kamikaze which put a big hole in the flight deck. What he did was while the air wing was off delivering ordnance on targets he put together a team and rebuilt the flight deck in something like four and a half hours so that after they did their mission they actually recovered the air wing on board the same carrier that they took off from. So he was sort of an engineering improvisation hero of the Navy.

And what we needed to do what we wanted to do, what Admiral Burke's vision was, we wanted to launch an intercontinental ballistic missile with significant range from underwater. That required an amazing level of engineering innovation. In fact it even required a new way to think about how to do engineering. What we essentially needed was about five successive miracles to happen and the methodology by which those miracles happened, none of them had yet been invented.

Anyone here have like a degree in management or project management, or ever go to school something like that? Do you know what a PERT chart is? So they actually invented the PERT chart to manage this process. Everyone was allocated, here's your piece of underwater launch. You work on the guidance, you work on making the weapon small enough to fit in this smaller missile. And they did all that and he got his assignment in 1955, they said go do this, and they launched the first missile from a submerged submarine in 1960. Again, all he had to do was build a missile, take a submarine, cut it in half, put a missile compartment in that submarine, weld it back together, and then go off. Then in 1960 they shot the first two missiles. They swapped crews. They shot two more. They came in, did a couple of weeks of maintenance and they went off and loaded the missiles and then they went on a 60 day patrol right after that.

Think about that, if you've been in the weapons procurement business lately, and you think about how long it takes us to do the administration associated with a new program. Never mind conceive, design, test, deliver, deploy in five years. It's amazing. It's amazing. It was done under the intense pressure of this worldwide competition of the Cold War.

We can learn a lot from that, I think, as to how to remove barriers, work together, delegate, have high expectations and deliver.

But another thing emerged -- That was the Navy piece. Similarly remarkable things that you know more about than I do were happening on the Air Force side. We got the B-52 bomber, which I just toured one about half an hour ago. Pretty amazing today. It must have been incredibly amazing for the 1950s. We got the Minuteman missile concept came to life. And then this whole overarching concept that every one of us in this room supports called the strategic triad came to be.

This triad was overseen by people like Admiral Burke and General LeMay, but I think it was also overseen by three presidents -- President Truman, President Eisenhower, and then President Kennedy when it came to deploy. And these people, these were folks from different political parties, but all of whom had a very strong belief in the need for a strong strategic defense and an embodiment in this form of a triad. And if you think about what those three presidents plus those two general officers all had in common, one thing they had in common was every one of them had fought at the pointy end of World War. They had seen up close what a massive destruction [inaudible] on modern society. And they essentially set about to make sure that that could never happen again.

For 70 years, they've been successful at that. We have not had this industrial scale warfare since we developed this nuclear capability. And that is something for everyone in this room who works in this business to take a great deal of pride in.

Of course the triad evolved. The Navy went from a fleet of 41 submarines with a number of overseas deployed bases because that's what we had to have to cover down on our target set, to a fleet today of 14 submarines from two bases and we can do that because we now have a missile that essentially will reach its intended target from the time we leave home port.

So although some of the components are more expensive, i.e., the submarines are a little bigger, cost a little more, the system is hugely efficient and less expensive compared to the one it replaced.

So there we are. The Navy's in the lower left hand corner, and we're covering down on a portion of that strategic mission. We cover down on the assured nuclear response. There is virtually no scenario in which someone can conduct a sneak attack with weapons of mass destruction on the U.S. without retaliation because I always have submarines at sea ready, and they're totally divorced from any support from land, and they can respond in our behalf. So there's no [inaudible].

In the lower right hand corner, of course, we have what many of you here do. That's the Air Force missile business. You hold down that massive immediate response from the U.S. homeland and anyone who attacks the homeland, especially if they try to remove the power, the power grid system, they know that they're faced with the most timely response possible because you in the job that you do are ready faster -- you're faster than my guys are because you can do what you do on a very short notice. That is a unique part of the business and very important.

Then we cap that off with the folks at the top, in the bomber wings, who have this very precise method of delivery. Not that the other two aren't extremely precise, but precise in a way that the public has extreme confidence in because they would know that if we came into a challenging situation, a delicate situation where this type of power might need to be used, the citizens of this country really like the idea that until that very last second there's a team of people that they trust in that cockpit who can release on order or if the order is to resolve this, come on home, can act on

that as well. There's a human dimension to that aspect that is very very satisfying to our people and to our leadership.

Again, we each have our specific roles, but as I said before, we're in this together and together we have a phenomenal capability that has a great deal of balance if we're each ready to do our job.

Just a few notes here about the future of my part of the business. We intend to replace our Ohio Class submarines as they approach 42 years of service. We designed them for 30 years. We did some engineering studies and determined that we could extend them to 42. But there's no science or testing that can take something that is put in the ocean where despite your best effort it does start to rust from day one, and take it more than 42 years out.

So in a further step for efficiency, we intend to take our current fleet of 14 submarines and account for the fact that at any one time about two of them are off-line getting refueled, we're going to build a class that never has to be refueled and we're going to buy only 12. We'll maintain the same level of presence in support of STRATCOM that we do today.

So it's a significant undertaking. Our plan is to finish up the design in the next five years or so. We're going to start bending metal and building submarines in 2021, and we'll deliver the ship in the late '20s and go on patrol until 2031. That will allow us -- There's a graph here that shows how new subs come on-line and go off-line, and we're at the point now where we've not really for technical reasons but for budget reasons we've accepted a few delays. But we can't accept anymore.

So for us to hold up our end, we need to keep working to build those ships.

Of course we're not doing this in a vacuum. The world gets a vote in what the future strategic balance will be. So as we sit here with our agency that I show on the left, both the Russians and the Chinese are putting out some pretty capable submarines at a pretty good rate, it turns out, about one to two a year. And on the right hand side of those screens is the newest, in the middle on the right is the newest Russian ballistic missile submarine which has recently done successful launches of [inaudible] ballistic missile. And on the lower right is the Chinese new submarine which is also in active production and which they claim can hit the United States from waters off of China. So again, this is not a static problem and we need to maintain the type of power that's required to deter peer competitors. We need to be in this business at all levels.

Of course this is the slide that is simply a bar chart of STRATCOM and all the task force commanders. But I want to reinforce this theme of a team, because when I look at this slide, or something like that, what I don't really see is a chain of command or an org chart so much as it's kind of a hook-ball line to me.

I know you can't read this in the back, but if you look across from the bottom row, think of that triad with the different specialties there. On the lower left you've got General Weinstein's

missileers. Some of you guys are here, right? So that's you on the lower left. You're the rapid response, massive response option that's always ready.

Then on the next place we have Task Force 204, so General Vander Hamm's bombers with that precision capability, that elegant touch, that high level of confidence that the public has in highly skilled aviators and trained crews who can deliver on time, on target.

In the middle two are like connective tissue. So we have the tankers. Any tankers here today? Yeah, we've got one -- more than one. Face it, the bombers probably can't do much wherever you need it without the tankers. So that's their job. They extend us.

Next we have some Navy people who fly big planes, that's Task Force 124 commanded by Heather Cole, and she and her folks provide the communications connective tissue. Because while we live day to day in the world of perfect coms, we need to be ready for the fight if needed in a world of horrific coms. And at that point Heather Cole's task force of Navy tactical aircraft become the lifeline for both the Navy and Air Force in keeping this mission viable.

Then on the lower right, we have Admiral Phil Sawyer in his Pacific submarines; and in the lower right that's me with my Atlantic submarines.

The point is, this is a team lineup, a team roster, and we each have our specialties but the system doesn't work really unless every one of those is working.

This is a graph that some of you have seen. It comes from a World Almanac publication. I know you can't see the numbers but I'll explain it to you if you're in the back. What it shows is the percentage of the world population basically killed directly or indirectly by war over time going back hundreds of years. And the general trend was, lots of wars, lots of direct injury, lots of side effect injuries from wars, to the point that for centuries 1.5 to 2 percent of the world population was killed in a major power war.

Then there were some declines that were made as nations of the world became more civilized. But then we had a couple of spikes because along with the more civilized world we also had this highly industrial world that could do everything including kill our fellow man much more efficiently than we could before. Those two spikes that you see there, are World War I and World War II, the real first industrial age wars. So you look at how high that spike was in World War II, where essentially 2.5 percent of humanity was killed as a result of a major power war. And oh by the way, that would have been higher but for what happened in August 1945 when our [business] started when the Enola Gay released her payload.

Since then, now we're down to very small fractions of a percent. Yes, violence makes the news every day, we have terrorism, we have what's going on, but nothing that is happening today is anything near the scale of what was essentially fairly routine throughout much of our history.

The reason it is low is because of what you folks do day in and day out with a great deal of precision and a great deal of commitment.

So I'd like you to think for a minute -- How many folks are here from out of town? When you're riding back to North Dakota or Wyoming or Missouri or wherever you're going, and you think about hey, what did I do this week? Okay. You can I kicked ass at Global Strike Challenge. You can say that. Some of you anyway, right? I thought I'd hear some sticks on that. I'm really disappointed.

But the other thing that you can say is that me and my teammates from this community held down the level of violence in the world to a tiny fraction of what it otherwise would have been but for us getting up, going to the silo, going to the hangar and doing our job with a great deal of skill and a great deal of precision. This is what you do. You keep us on the lowest end of that scale possible. Then the rest of the military can play with that smaller number to keep that as low as possible.

But there's more. You do this, and we can continue to do this at costs about, between the Navy and the Air Force, about \$23 billion a year which is about five percent of the defense budget or about one-half of one percent, actually less than that, of the U.S. budget. Okay?

So you with your skill and five percent of the defense budget keep the level of violence in the world down for us and for our allies.

This is an amazing thing that you're doing. Largely under-appreciated by most of your fellow citizens, but hugely important nonetheless. And I hope you feel good about that. You have a definite right to.

So I said at the beginning that we're in this together. And we're in it because we have complementary capabilities, which we talked about, and we also have tremendous opportunities for collaboration. The Navy and the Air Force are revitalizing their strategic systems. There are many aspects of that that use common technology. And we can provide the best value for the country if we work to coordinate some of that, and we are. Our technical people are working on that.

At the operational level, this is not a static problem so we need to work together to look at how we cover down on new emerging threats to make sure that we continue to do this mission in support of STRATCOM as effectively as possible.

We're increasingly discovering and in particular we've been partnering with General Wilson's folks on this, as we develop our people, we reinvigorate our philosophy, the way we approach it, there's a lot we can do together in the area. So we call it force development. And the Navy and the Air Force are running sort of parallel force improvement programs. Each learns from the lessons of the other. In essence we're doing the same thing. We're taking highly talented people, we're training them to operate at a very high standard, working in a mission where it's extremely vital that things

be done with precision, to ensure that the country sustains confidence in our ability to do this very important job.

So we're even at the point where we're going to start some exchanges of people. I'm sending some folks to the Air Force to learn from the Air Force; General Wilson is sending some folks to my staff and my counterpart in the Pacific to do the same thing. What will come out of that is we will both be better for bringing what we have to the other service, and then when we finish that tour, bringing something back home.

So I want you to know I'm very excited about my role in that. I'm very excited about your role in that in the Air Force, because we're depending on you and again, none of us solves the problem on their own, but together we're very much an unbeatable team.